

- 63 -

CLAIMS:

1. A process for developing a voice application, including:
generating graphical user interface components for defining execution paths of said
5 application by arranging dialog elements in a tree structure, each path through said tree
structure representing one of said execution paths;
generating said dialog elements on the basis of predetermined templates and
properties of said dialog elements, said properties received from a user via said graphical
user interface components, each of said dialog elements corresponding to at least one voice
10 language template; and
generating at least one voice language module for said application on the basis of
said at least one voice language template and said properties.
2. A process as claimed in claim 1, wherein the voice language templates include
15 VoiceXML elements.
3. A process as claimed in claim 2, wherein said at least one voice language module
includes extended VoiceXML elements including VoiceXML tags and additional
information to allow said dialog elements to be generated from said at least one voice
20 language module.
4. A process as claimed in claim 3, wherein said additional information includes one
or more attributes of said VoiceXML tags.
- 25 5. A process as claimed in claim 4, wherein said one or more attributes include
qualified names.
6. A process as claimed in claim 1, wherein each of said at least one voice language
modules includes a reference to the next of said at least one voice language modules in an
30 execution path of said application.

- 64 -

7. A process as claimed in claim 1, including generating a graphical representation of said dialog elements and said execution paths on the basis of said at least one voice language module.
- 5 8. A process as claimed in claim 1, including generating extended VoiceXML code, prompt data, and grammar data for said application.
9. A process as claimed in claim 8, wherein said prompt data is represented as a grammar, and said process includes improving said grammar.
- 10 10. A process as claimed in claim 1, including generating at least one script for generating a prompt for said application on the basis of one or more parameters supplied to said script.
- 15 11. A process as claimed in claim 10, wherein said at least one script is generated on the basis of at least one script template and prompt data defined for said prompt by a user.
12. A process as claimed in claim 11, wherein said at least one script includes EMCAscript.
- 20 13. A process as claimed in claim 8, including generating VoiceXML code and IVR grammar data for execution of said application on an IVR system on the basis of said extended VoiceXML code, prompt data, and grammar data.
- 25 14. A system having components for executing a process as claimed in any one of the preceding claims.
15. Program code for executing a process as claimed in any one of claims 1 to 13.
- 30 16. A computer readable storage medium having stored thereon program code for executing a process as claimed in any of claims 1 to 13.

- 65 -

17. A system for use in developing a voice application, including:
a dialog element selector for defining execution paths of said application by selecting dialog elements and adding said dialog elements to a tree structure, each path
5 through said tree structure representing one of said execution paths;
a dialog element generator for generating said dialog elements on the basis of predetermined templates and properties of said dialog elements, said properties received from a user of said system, each of said dialog elements corresponding to at least one voice language template; and
10 a code generator for generating at least one voice language module for said application on the basis of said at least one voice language template and said properties.
18. A system as claimed in claim 17, wherein said selector is adapted to generate a graphical representation of said dialog elements and said execution paths on the basis of
15 said at least one voice language module.
19. A system as claimed in claim 17, wherein said code generator is adapted to generate extended VoiceXML code, prompt data, and grammar data for said application.
20. A system as claimed in claim 19, wherein said prompt data is represented as a grammar, and the system includes one or more modules for improving said grammar.
21. A system as claimed in claim 17, including a script generator for generating at least one script for generating a prompt for said application on the basis of one or more
25 parameters supplied to said script.
22. A system as claimed in claim 21, wherein said script generator is adapted to generate said at least one script on the basis of at least one script template and prompt data defined for said prompt by a user.

- 66 -

23. A system as claimed in claim 19, wherein said code generator is adapted to generate VoiceXML code and IVR grammar data for execution of said application on an IVR system on the basis of said extended VoiceXML code, prompt data, and grammar data.

5

24. An extended VoiceXML file generated by a system as claimed in any one of claims 17 to 23.

25. A graphical user interface for use in developing a voice application, said interface including graphical user interface components for defining execution paths of said application by arranging configurable dialog elements in a tree structure, each path through said tree structure representing one of said execution paths, and said dialog element components may include one or more of:

- 15 a start dialog component for defining the start of said application;
- a variables component for use in defining variables for said application;
- a menu component for defining a menu;
- a menu choice component for defining a choice of said menu;
- a decision component for defining a decision branching point;
- 20 a decision branch component for defining a test condition and an execution branch of said decision branching point;
- a form component for defining a form to collect input from a caller;
- a record component for recording audio
- a speaker component for playing prompts,
- a local processing component for defining local processing;
- 25 a remote processing component for performing processing on a remote system;
- a loop component for defining an execution loop;
- a loop call component for calling said loop;
- a loop next component for proceeding to the next cycle of said loop;
- a loop break component for breaking out of said loop;
- 30 a subroutine component for defining a subroutine;
- a subroutine call component for calling said subroutine;

- 67 -

- subroutine return component for returning from said subroutine;
- a jump component for defining a non-sequential execution path to a dialog element
- a transfer component representing the transfer of a call to another number
- a hotwords component for defining a word or phrase and a non-sequential
- 5 execution path to a dialog element to be followed upon receipt of said word or phrase; and
- an end component for defining an end of said application.